The World Standard for Industrial Lenses.

At CBC, we have set the world standard for industrial lenses through the design, manufacture and global sales of the “Computar” brand. Since the very beginning of the video security market, we have established a strong worldwide distribution network. As a pioneer in CCTV lenses, CBC and the Computar brand have grown along with the demands of the world market.

Computar CCTV lenses were introduced in the U.S.A. during the mid 1970s and have continued to meet security challenges globally for more than 30 years. Today, we lead the industry in Japan, Europe, Asia and markets all over the world. We offer a comprehensive lineup of high-quality products with excellent cost performance. Our designs utilize leading-edge technology, enabling us to achieve the highest quality while also ramping up production in our factories in Japan and abroad. We are proud to have an established worldwide sales network, built on the excellence of our Computar products.

CBC is committed to maintaining the world standard for industrial lenses through continuous research and development. We continue to strive to achieve even greater quality to meet our customer needs for today's evolving security challenges.
FEATURE INDICATION

<table>
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<th>Lens type</th>
<th>Description</th>
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<td><strong>FIX</strong></td>
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<tr>
<td><strong>VAR</strong></td>
<td>Vari-Focal</td>
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<tr>
<td><strong>ZOOM</strong></td>
<td>Zoom</td>
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**Iris type**

- **Manual Iris** | Manually operated iris |
- **DC** | DC Auto Iris | Auto iris supporting DC controlled cameras |
- **VIDEO** | Video Auto Iris | Auto iris supporting Video controlled cameras |
- **P-IRIS** | P-iris | Auto iris supporting P-iris controlled cameras |
- **3 Motors** | Operated iris, zoom and focus by electric remote control |

**Function**

- **F1.0** | Wide Aperture Ratio | Large aperture that transmits more light |
- **ASP** | Aspherical Lens | Aspherical lens which greatly improves the image quality and compact design |
- **1MP** | Megapixel Lens | High definition lens which is used mainly with 1MP cameras |
- **2MP** | Megapixel Lens | High definition lens which is used mainly with 2MP cameras |
- **3MP** | Megapixel Lens | High definition lens which is used mainly with 3MP cameras |
- **5MP** | Megapixel Lens | High definition lens which is used mainly with 5MP cameras |
- **IR** | Day & Night Lens | Lens optimized for both visible and new IR spectrum which eliminates focus shift with Day & Night cameras |

**Feature of Focal Length**

- **WIDE** | Wide Angle Lens | Lens provides a wide field of view |
- **TELE** | Telephoto Lens | Lens provides a small field of view or magnified image in long range applications |

**Feature of Zoom**

- **SPOT FILTER** | Spot Filter | A neutral density filter inside the lens that attenuates the amount of light transmission from very bright object |
- **PRES** | Preset on Focus & Zoom | The model which has the function of preset on focus and zoom |
- **IR** | Override Manual | The model which enables manual control from remote locations |

**Application of Megapixel / FA Lens**

- **SECURITY** | Security | For Security, available for monitoring at infinity. Provides good image recognition accuracy |
- **FA** | FA Image Processing | For Factory Automation or Image Processing, used in monitoring at a close proximity |

**Thermal**

- **Athermal** | Athermal | Athermalized lens which maintains focus position over wide change of the environmental temperature |
- **17µm pitch Sensor** | Thermal lens which can be used with 17µm pitch sensor |

MODEL NAME CODING RULE

| Manual Iris / Auto Iris (DC & Video) / Vari-Focal Manual Iris / Vari-Focal Auto Iris (DC & Video) |
| T23114FCS | T | 23 | 14 | F1 | CS |
| T322910CS | T | 32 | 29 | 10 | CS |
| HG324512AFCS-IR | H | G | 32 | 45 | 12 | AF | CS | -IR |
| HG220414FC-MP | H | G | 22 | 04 | 14 | F | C | -MP |
| AG323112KCS-MPIR | A | G | 32 | 31 | 12 | F | C | K | CS | -MPIR |

- **Sensor Size** 1/3 inch | H | 1/2.7 inch | A | 1/2 inch | E | 1/1.8 inch | M | 2/3 inch |
- **Zoom Ratio** 2 times (f=4~8mm) | T2 23 14FCS | T | 23 | 14 | F1.0 |
- **Iris Type** FI | Blank | Manual Iris | F | Auto Iris (DC) |
- **Character** IR | Blank | Day & Night Lens | D | Video Drive |
- **Mount Type** CS | Blank | CS-Mount | C | C-Mount |
- **Optical** Spot Filter | Megapixel | Megapixel |
- **Function** | P-iris | Auto Iris (DC) |
- **Iris Type** | DC | Auto Iris (DC) + Spot Filter + Preset |
- **Model Name** | AMSR | Auto Iris (Video) + Spot Filter + Preset |
- **MPEG** | H | 608 | 12 | IR | A | MS | MP |

- **Manual Zoom**

| H620812 | H | 62 | 08 | 12 |
| T625710AIDC-CS | T | 62 | 57 | 10 | AI | DC | CS |
| H620812AIVD | H | 62 | 08 | 12 | AI | VD |

- **Motorized Zoom**

| T2125816M-CS | T | 212 | 58 | 16 | M | -CS |
| H1023218DC | H | 102 | 12 | 18 | DC |
| H1627516AAMSPR-IR | H | 162 | 75 | 16 | AMSPR | -IR |
| H6021238A-IRF | H | 602 | 12 | 38 | A | -IR | F |

- **Functional Identification** M | 3 Motors (Iris, Focus & Zoom by Motorized Control) |
- **A** | Security |
- **P** | FA Image Processing |
- **M** | Motorized Zoom |
- **DC** | Security |
- **WP** | Security |
- **PD** | Security |
- **EX** | 2X extender |

※ This rule does not apply to some products
Megapixel

Vari-Focal lens series

- Designed for optimal performance with megapixel camera applications
- IR corrected optics
- Precise focus adjustment
- Covers a range of focal lengths from super wide to telephoto
- Provides a high contrast and a sharp picture
- Delivers clear images in low-light conditions
- Compact design
- Built-in slip mount mechanism
- Locking mechanism for zoom and focus rings
- Manual, DC and P-iris models are available

For 3MP/HDTV1080p network camera

This lens is designed to capture detailed images for security applications that require exceptional precision. High quality optics maximize performance with 3MP/HDTV1080p megapixel camera sensors and produce a sharp picture across the entire image plane, including the corners.

Precise focus adjustment

Setting the focus on megapixel IP cameras can be a challenge, especially when facing the limited adjustment ranges and transmission delays, that occur through a network. For this series, the focus mechanism has been designed to allow more precise focus control.

Manual, DC and P-iris models are available

Both manual iris and DC auto iris models are available to meet your needs. The P-iris lens, combined with specialized camera software, delivers superior picture quality, enhancing contrast, resolution and depth of field.

Megapixel lens

Non-Megapixel lens

IR corrected optics designed for 24-hour surveillance

Megapixel cameras with retractable IR cut filters must use IR corrected lenses to avoid focus shift. Our lenses are designed to work with these true day & night cameras, maintaining sharp focus in both day and night modes, even in twilight.

Covering a range of focal lengths, from super wide to telephoto

The AG3Z3112 series allows you to capture 105.4-degree overview in a 16:9 format. Telephoto models in the AG4Z1214 series are suitable for various outdoor and high ceiling applications.

Note: Images above are for illustration purposes only.
Megapixel zoom ratio: 0.5x - 0.07x
Telecentric design: 0.25x - 0.5x
Adjustable W.D.: 182mm - 577.2mm

This high performance lens incorporates two design functions. It operates both as a 7x macro zoom lens with 0.07x to 0.5x magnification and as a telecentric lens within the 0.25x to 0.5x magnification range. It provides excellent brightness throughout the zoom range, maintaining 70% illumination even in the corners of the image. Working distance is adjustable from 182 - 577.2mm, and an F4.3-32C manual iris allows for precise depth of field and contrast adjustments. The lens is suitable for cameras up to 5 megapixel resolution for a 1.1-inch sensor. This combination of features offers the versatility to meet a wide range of industrial applications.

**TEC-V7X Field of view (mm)**

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### Manual Iris CS-Mount

#### T2314FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.3
- **Aperture (F)**: 1.4-16C
- **Angle of View (HOR)**: 113.3
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 22.8/8.0
- **Front Fiber Thread (G1/4-P)**: 7.0
- **Dimensions**: Ø34.5 x 35.4
- **Weight (g)**: 43

#### T2616FCS-4
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.6
- **Aperture (F)**: 1.6-11C
- **Angle of View (HOR)**: 99.6
- **M.O.D. (m)**: 0.3
- **Effective Aperture (Front/Rear)**: 16.4/8.0
- **Front Fiber Thread (G1/4-P)**: 8.5
- **Dimensions**: Ø34.5 x 33.7
- **Weight (g)**: 36

#### T2812FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.8
- **Aperture (F)**: 1.2-16C
- **Angle of View (HOR)**: 83.9
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 15.5/8.5
- **Front Fiber Thread (G1/4-P)**: 8.5
- **Dimensions**: Ø34.5 x 33
- **Weight (g)**: 37

#### T2812FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.8
- **Aperture (F)**: 1.2-16C
- **Angle of View (HOR)**: 83.9
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 15.5/8.5
- **Front Fiber Thread (G1/4-P)**: 8.5
- **Dimensions**: Ø34.5 x 33
- **Weight (g)**: 37

### Manual Iris C-Mount

#### T2314FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.3
- **Aperture (F)**: 1.4-16C
- **Angle of View (HOR)**: 113.3
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 22.8/8.0
- **Front Fiber Thread (G1/4-P)**: 7.0
- **Dimensions**: Ø34.5 x 35.4
- **Weight (g)**: 43

#### T2616FCS-4
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.6
- **Aperture (F)**: 1.6-11C
- **Angle of View (HOR)**: 99.6
- **M.O.D. (m)**: 0.3
- **Effective Aperture (Front/Rear)**: 16.4/8.0
- **Front Fiber Thread (G1/4-P)**: 8.5
- **Dimensions**: Ø34.5 x 33.7
- **Weight (g)**: 36

### Manual Iris DC Drive / Video Drive

#### MB113
- **Format (T)**: 1/3
- **Mount**: C
- **Focal Length (mm)**: 8.5
- **Aperture (F)**: 1.3-16C
- **Angle of View (HOR)**: 57.4
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 20.5/8.0
- **Front Fiber Thread (G1/4-P)**: 12.0
- **Dimensions**: Ø39 x 31.6
- **Weight (g)**: 50

#### TG2314FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.3
- **Aperture (F)**: 1.4-16C
- **Angle of View (HOR)**: 113.3
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 22.8/8.0
- **Front Fiber Thread (G1/4-P)**: 7.0
- **Dimensions**: Ø32 x 39.8 x 35.4
- **Weight (g)**: 45

#### TG2616FCS-4
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 2.6
- **Aperture (F)**: 1.6-16C
- **Angle of View (HOR)**: 113.3
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 22.8/8.0
- **Front Fiber Thread (G1/4-P)**: 7.0
- **Dimensions**: Ø32 x 39.8 x 34.7
- **Weight (g)**: 47

#### TG412FCS-3
- **Format (T)**: 1/3
- **Mount**: CS
- **Focal Length (mm)**: 4
- **Aperture (F)**: 1.2-16C
- **Angle of View (HOR)**: 60.9
- **M.O.D. (m)**: 0.2
- **Effective Aperture (Front/Rear)**: 15.5/8.5
- **Front Fiber Thread (G1/4-P)**: 8.5
- **Dimensions**: Ø32 x 39.8 x 33
- **Weight (g)**: 38
### Vari-Focal Lens Comparison

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<td>ø37.4 x 42.6 x 51.1</td>
<td>ø37.4 x 42.6 x 51.1</td>
<td>ø37.4 x 42.6 x 51.1</td>
<td>ø37.4 x 42.6 x 51.1</td>
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<td>ø37.4 x 42.6 x 51.1</td>
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<td>74</td>
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### Dimensions

#### TG221816FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG222110FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG221910FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG223510FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG223510FCS-IR
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG422813FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG102513FCS-3
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### TG28513FCS-3
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### HG224516FCS-2
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### HG324513FCS-IR
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g

#### HG321014FCS
- Dimensions: ø37.4 x 42.6 x 51.1
- Weight: 74 g
### Vari-Focal Lens Comparison

#### Video Drive

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<thead>
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<th>TG2Z321816AFCS</th>
<th>TG2Z321816AFCS-IR</th>
<th>TG2Z321916AFCS-IR</th>
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<td>8.5-4.8</td>
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<td>10-5.7</td>
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<td>33.5 x 42.6 x 43.5</td>
<td>33.5 x 42.6 x 43.5</td>
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#### Technical Specifications

- **Model No:** TG2Z1816AFCS
- **Mount:** CS
- **Focal Length (mm):** 4.5-3.6
- **Aperture (F):** 1.0
- **Effective Aperture:** Front (F) 1.2
- **Focal Length (mm):** 4.5-3.6
- **Aperture (F):** 1.0
- **Angle of View (HOR):** 81.3-38.5
- **M.O.D. (m):** 0.3
- **Front Fiber Thread (4ANP-=):** 1.5 x 0.5
- **Weight (g):** 130
- **Dimensions:** 33.5 x 42.6 x 43.5

- **Model No:** TG2Z321816AFCS
- **Mount:** CS
- **Focal Length (mm):** 8.5-4.8
- **Aperture (F):** 1.2-3.6
- **Effective Aperture:** Front (F) 1.3-3.6
- **Focal Length (mm):** 8.5-4.8
- **Aperture (F):** 1.2-3.6
- **Angle of View (HOR):** 81.3-38.5
- **M.O.D. (m):** 0.3
- **Front Fiber Thread (4ANP-=):** 1.5 x 0.5
- **Weight (g):** 110
- **Dimensions:** 33.5 x 42.6 x 43.5

- **Model No:** TG2Z321916AFCS-IR
- **Mount:** CS
- **Focal Length (mm):** 10-5.7
- **Aperture (F):** 1.2-3.6
- **Effective Aperture:** Front (F) 1.3-3.6
- **Focal Length (mm):** 10-5.7
- **Aperture (F):** 1.2-3.6
- **Angle of View (HOR):** 81.3-38.5
- **M.O.D. (m):** 0.3
- **Front Fiber Thread (4ANP-=):** 1.5 x 0.5
- **Weight (g):** 110
- **Dimensions:** 33.5 x 42.6 x 43.5

#### Additional Notes

- The lenses are designed for use with 1/2" camera sensors, offering a wide range of focal lengths and apertures to suit various applications.
- The effective apertures are calculated to optimize image quality and light sensitivity.
- The dimensions provided ensure compatibility with standard camera mounts and housings.
- The weight and dimensions are crucial for ensuring that the lenses are robust while also being lightweight for ease of use.

*Note: The image contains diagrams and illustrations of the lenses to aid in understanding their physical characteristics and dimensions.*
### T6Z5710 Series

**f 5.7-34.2 mm, F1.0**

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<thead>
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<th>MODEL NO.</th>
<th>Aperture (F)</th>
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<td>T6Z5710MP-CS</td>
<td>1.0-16C</td>
<td>470</td>
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<td>T6Z5710M-S-CS</td>
<td>1.0-36C</td>
<td>450</td>
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<td>4</td>
<td>T6Z5710MSP-CS</td>
<td>1.0-36C</td>
<td>470</td>
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<td>5</td>
<td>T6Z5710AMS-CS</td>
<td>1.0-36C</td>
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<td>6</td>
<td>T6Z5710AMSP-CS</td>
<td>1.0-36C</td>
<td>490</td>
</tr>
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<td>7</td>
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<td>8</td>
<td>T6Z5710PDC-CS</td>
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**Format:** 1/3

- **Mount:** CS
- **Focal Length (mm):** 5.7-34.2
- **Angle of View (HOR):** 45.9-8.1
- **M.O.D. (m):** 1.2
- **Effective Aperture:**
  - **Front:** 41.0
  - **Rear:** 10.2
- **Front Filter Thread (φMxP):** 49.0 x 0.75
- **Dimensions (WxHxD):** 68.5 x 76.3 x 82.5

### T10Z5712 Series

**f 5.7-57 mm, F1.2**

<table>
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<th>MODEL NO.</th>
<th>Aperture (F)</th>
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**Format:** 1/3

- **Mount:** CS
- **Focal Length (mm):** 5.7-57
- **Angle of View (HOR):** 44.6-4.8
- **M.O.D. (m):** 1.8
- **Effective Aperture:**
  - **Front:** 45.0
  - **Rear:** 8.6
- **Front Filter Thread (φMxP):** 49.0 x 0.75
- **Dimensions (WxHxD):** 68.5 x 76.3 x 88

---

**Angle of View**

**Technical Information**

**Accessories**

**Thermal Megapixel**
**T21Z5816 Series**

- **Model**: f 5.8-121.18mm, F1.6
- **Format**: 1/3"
- **Mount**: CS
- **Focal Length (mm)**: 5.8-121.8
- **Angle of View (HOR)**: 44.8-2.3
- **M.O.D. (m)**: 1.5
- **Effective Aperture**: Front (φmm): 53.2
- **Rear (φmm)**: 10.6
- **Filter Thread (φmmX=)**: 62.0 × 0.75
- **Dimensions (WxHxD)mm**: 70 × 81 × 126.5

**Features and Indications**:
- Motorized Zoom
- Pinhole
- Manual Zoom
- Vari-Focal
- Auto Iris
- Manual Iris
- Auto Iris

**Specifications**:

<table>
<thead>
<tr>
<th>No.</th>
<th>Model No.</th>
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<th>Weight (g)</th>
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<td>T21Z5816DCP-CS</td>
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**T34Z5518 Series**

- **Model**: f 5.5-187mm, F1.8
- **Format**: 1/3"
- **Mount**: CS
- **Focal Length (mm)**: 5.5-187
- **Angle of View (HOR)**: 46.6-1.5
- **M.O.D. (m)**: 1.5
- **Effective Aperture**: Front (φmm): 70.0
- **Rear (φmm)**: 9.1
- **Filter Thread (φmmX=)**: 77.0 × 0.75
- **Dimensions (WxHxD)mm**: 82 × 97.4 × 160

**Features and Indications**:
- Motorized Zoom
- Pinhole
- Manual Zoom
- Vari-Focal
- Auto Iris
- Manual Iris
- Auto Iris

**Specifications**:

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**H6Z0812 Series**

- **Model Name**: H6Z0812 Series
- **Format**: 1/2"
- **Focal Length**: 8-48mm
- **Aperture**: F1.2
- **F.O.R.**: 44.6°-8.0°
- **M.O.D.**: 1.2
- **Effective Aperture**: Front ø49.0 x 0.75
- **Dimensions**: 66 x 73.5 x 97

<table>
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<th>NO.</th>
<th>MODEL NO.</th>
<th>Aperture (F)</th>
<th>Weight (g)</th>
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**H10Z0812 Series**

- **Model Name**: H10Z0812 Series
- **Format**: 1/2"
- **Focal Length**: 8-80mm
- **Aperture**: F1.2
- **F.O.R.**: 44.0°-4.7°
- **M.O.D.**: 1.5
- **Effective Aperture**: Front ø54.0
- **Dimensions**: 70 x 81 x 123.5

<table>
<thead>
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<th>MODEL NO.</th>
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**Dimensions**

- **Format (")**: 1/2
- **Mount**: C
- **Focal Length (mm)**: 12-120
- **Angle of View (HOR)**: 29°-4.1°
- **M.O.D. (m)**: 1.5
- **Effective Aperture Front (φ mm)**: 54.0
- **Rear (φ mm)**: 9.2
- **Front Filter Thread (φMxP=) mm**: 62.0 × 0.75
- **Dimensions (WxHxD)mm**: 70 × 81 × 123.5

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>Aperture (F)</th>
<th>Weight (g)</th>
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</table>

**Dimensions**

- **Format (")**: 1/2
- **Mount**: C
- **Focal Length (mm)**: 7.5-120
- **Angle of View (HOR)**: 46.6°-3.2°
- **M.O.D. (m)**: 1.5
- **Effective Aperture Front (φ mm)**: 66.4
- **Rear (φ mm)**: 13.5
- **Front Filter Thread (φMxP=) mm**: 72.0 × 0.75
- **Dimensions (WxHxD)mm**: 82 × 97.4 × 149
H16Z7516-IR Series  
**f 7.5-120mm, F1.6**

- **Format:** 1/2
- **Mount:** C
- **Focal Length (mm):** 7.5-120
- **Angle of View (HOR):** 47.0-3.1
- **M.O.D. (m):** 1.5
- **Effective Aperture Front (φ mm):** 68.0
- **Effective Aperture Rear (φ mm):** 14.3
- **Front Filter Thread (φ MxP):** 77.0 × 0.75
- **Dimensions (WxHxD)mm:** 82 × 97.4 × 161.5

**Features of H16Z7516-IR series**

Infrared light increases at night because the wavelength distribution changes greatly between day and night. In case of night surveillance with infrared lighting, standard CCTV lenses cause a focus shift because of the difference in wavelength distribution, even when focused properly during the day.

Computar’s new IR zoom lens utilizes a special optical glass material which minimizes light dispersion. As a result, refocusing is not required when used at night with infrared lighting. The lens also has a special multi-coating on all lens elements so that the lens transmits more light up to the infrared region. This provides a much more vivid picture when used at night with Day/Night cameras or ultra high sensitivity cameras.

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H30Z1015 Series  
**f 10-300mm, F1.5**

- **Format:** 1/2
- **Mount:** C
- **Focal Length (mm):** 10-300
- **Angle of View (HOR):** 35.5-1.25
- **M.O.D. (m):** 2.2
- **Effective Aperture Front (φ mm):** 94.0
- **Effective Aperture Rear (φ mm):** 14.8
- **Front Filter Thread (φ MxP):** 100 × 1
- **Dimensions (WxHxD)mm:** 125 × 144.5 × 246.5

**Features of H30Z1015 series**

This lens provides powerful zoom ratio (10-300mm) and the fastest F-stop (F1.5) in the CCTV market, making it ideal for long distance or low light surveillance. Typical applications include highway and traffic monitoring, port and harbor surveillance, airport surveillance and border patrol.
### H60Z1238 Series

**f 12.5-750mm, F3.8 / f 25-1500mm, F7.6 (w/2x extender)**

**Format (")**: 1/2

**Mount**: C

**Focal Length (mm)**:
- 12.5-750
- 25-1500 (with 2x extender)

**Angle of View (HOR)**:
- 28.7-0.48

**M.O.D. (m)**: 5.0

**Effective Aperture**:
- Front (φ mm): 98.8
- Rear (φ mm): 13.6

**Front Filter Thread (φ x M x P)**: 107 x 1

**Dimensions (W x H x D) mm**: 154 x 137 x 354

### H21Z1016-MP Series

**f 10-210mm, F1.6**

**Format (")**: 1/2

**Mount**: C

**Focal Length (mm)**: 10-210

**Angle of View (HOR)**:
- 35.4-1.72

**M.O.D. (m)**: 2.0

**Effective Aperture**:
- Front (φ mm): 68.0
- Rear (φ mm): 11.8

**Front Filter Thread (φ x M x P)**: 72.0 x 0.75

**Dimensions (W x H x D) mm**: 84 x 94.5 x 181.5

### Table: Models and Specifications

#### H60Z1238 Series

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#### H21Z1016-MP Series

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### E24Z1018-MP Series

**f 10-240mm, F1.8**

**x 24**

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**Dimensions (W×HxD)(mm)**: 101 × 99.4 × 198.2

### E24Z1018-Mipy Series

**f 10-240mm, F1.8**

**x 24**

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<th>MODEL NO.</th>
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<th>Focal Length (mm)</th>
<th>Angle of View (HOR)°</th>
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</table>

**Dimensions (W×HxD)(mm)**: 101 × 99.4 × 198.2

---

※Override and Iris preset models are acceptable. Please contact us.

※P-iris lenses can only be controlled by specifically designed cameras with P-iris software.
1/2" MEGAPIXEL MOTORIZED ZOOM

**H35Z1015-MP Series**

* f 10-350mm, F1.5

**Format (")**: 1/2

**Focal Length (mm)**: 10-350

**Angle of View (HOR)**: 35.30°-1.05°

**M.O.D. (m)**: 2.5

**Effective Aperture Front (φ mm)**: 80.1

**Rear (φ mm)**: 17.3

**Front Filter Thread (φMxP=)**: 86 x 1

**Dimensions (WxHxD)mm**: 97 x 109 x 245

---

**H62Z1235-MP Series**

* f 12.5-775mm, F3.5 / f 25-1550mm, F7.0 (with 2 x extender)

**Format (")**: 1/2

**Focal Length (mm)**: 12.5-775 and 25-1550 (with 2x extender)

**Angle of View (HOR)**: 28.77°-0.47°

**M.O.D. (m)**: 5.0

**Effective Aperture Front (φ mm)**: 98.5

**Rear (φ mm)**: 17.5

**Front Filter Thread (φMxP=)**: 107 x 1

**Dimensions (WxHxD)mm**: 150 x 135 x 367.5

---

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Non-Preset model is acceptable. Please contact us.
**Model No.** TG4Z2816FCS-MPIC

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 2.8-12

**Aperture (F):** 1.4-16C

**Angle of View (HOR°):** 102.2-23.7

**M.O.D. (m):** 0.3

**Effective Aperture (Front):** 23.0

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø37.5 x 48 x 56

**Weight (g):** 71

---

**Model No.** H2Z0418C-MPIC

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 1.4-16C

**Aperture (F):** 1.4-4.7

**Angle of View (HOR°):** 90.4-47.0

**M.O.D. (m):** 0.5

**Effective Aperture (Front):** 22.2

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø41.6 x 48.8

**Weight (g):** 72

---

**Model No.** H5Z2516C-MPIC

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 1.4-360

**Aperture (F):** 1.8-16C

**Angle of View (HOR°):** 24.0-6.2

**M.O.D. (m):** 1.0

**Effective Aperture (Front):** 21.7

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø48 x 56.2

**Weight (g):** 60

---

**Model No.** A4Z1214CS-MPIR

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 14.5-2.8

**Aperture (F):** 1.4-16C

**Angle of View (HOR°):** 105.3-35.3

**M.O.D. (m):** 0.5

**Effective Aperture (Front):** 10.3

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø38.5 x 48 x 53

**Weight (g):** 105

---

**Model No.** A3Z3112CS-MPIR

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 12.5-3.0

**Aperture (F):** 1.8-16C

**Angle of View (HOR°):** 24.0-6.2

**M.O.D. (m):** 0.5

**Effective Aperture (Front):** 10.3

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø40 x 55

**Weight (g):** 54.5

---

**Model No.** E3Z4618CS-MPIC

**Format:** 1/3

**Mount:** C

**Focal Length (mm):** 4.5-13.2

**Aperture (F):** 1.4-16C

**Angle of View (HOR°):** 105.3-35.3

**M.O.D. (m):** 0.5

**Effective Aperture (Front):** 25.1

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø42 x 61

**Weight (g):** 148

---

**Model No.** H3Z2816C-MPIC

**Format:** 1/2

**Mount:** C

**Focal Length (mm):** 25-13.5

**Aperture (F):** 1.8-16C

**Angle of View (HOR°):** 143.2-28.3

**M.O.D. (m):** 1.5

**Effective Aperture (Front):** 44.2

**Front Filter Thread (MMP-M):** 1-32UNF

**Dimensions:** Ø42 x 61.7

**Weight (g):** 141
**MEGAPIXEL SECURITY**

**MEGAPIXEL VARI-FOCAL AUTO IRIS**

**MEGAPIXEL VARI-FOCAL P-IRIS**

---

**MODEL NO.** AG331124FCS-MP1R

- **Format:** 1/2.7
- **Mount:** CS
- **Focal Length (mm):** 12.5-38
- **Aperture (F):** 1.4-360C
- **Angle of View (HOR):** 39.2-90.7
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 1.5
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø40 x 50 x 58.4
- **Weight (g):** 100

---

**MODEL NO.** AG212414FCS-MP1R

- **Format:** 1/2.7
- **Mount:** CS
- **Focal Length (mm):** 12.5-38
- **Aperture (F):** 1.4-360C
- **Angle of View (HOR):** 39.2-90.7
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 1.5
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø40 x 50 x 58.4
- **Weight (g):** 100

---

**MODEL NO.** HGG232118FC-MP1R

- **Format:** 1/1
- **Mount:** C
- **Focal Length (mm):** 25-135
- **Aperture (F):** 1.8-360C
- **Angle of View (HOR):** 45.2-2.8
- **M.O.D. (W):** 1.5
- **Effective Aperture (F):** 44.7
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø54 x 82 x 118
- **Weight (g):** 402

---

**MODEL NO.** TG203124FCS-MP1R

- **Format:** 1/3
- **Mount:** CS
- **Focal Length (mm):** 3-8
- **Aperture (F):** 1.2-360C
- **Angle of View (HOR):** 90.7-35.2
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 20.9
- **Front Filter Thread:** M10x0.5
- **Dimensions:** Ø37 x 48.2 x 55
- **Weight (g):** 102

---

**MODEL NO.** TG3031124FCS-MP1R

- **Format:** 1/3
- **Mount:** CS
- **Focal Length (mm):** 3-8
- **Aperture (F):** 1.2-360C
- **Angle of View (HOR):** 90.7-35.2
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 20.9
- **Front Filter Thread:** M10x0.5
- **Dimensions:** Ø37 x 48.2 x 55
- **Weight (g):** 102

---

**MODEL NO.** AG212124FC-MP1R

- **Format:** 1/2.7
- **Mount:** CS
- **Focal Length (mm):** 12.5-38
- **Aperture (F):** 1.4-360C
- **Angle of View (HOR):** 39.2-90.7
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 1.5
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø40 x 50 x 58.4
- **Weight (g):** 100

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**MODEL NO.** AG212124FC-MP1R

- **Format:** 1/2.7
- **Mount:** CS
- **Focal Length (mm):** 12.5-38
- **Aperture (F):** 1.4-360C
- **Angle of View (HOR):** 39.2-90.7
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 1.5
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø40 x 50 x 58.4
- **Weight (g):** 100

---

**MODEL NO.** AG212124FC-MP1R

- **Format:** 1/2.7
- **Mount:** CS
- **Focal Length (mm):** 12.5-38
- **Aperture (F):** 1.4-360C
- **Angle of View (HOR):** 39.2-90.7
- **M.O.D. (W):** 0.3
- **Effective Aperture (F):** 1.5
- **Front Filter Thread:** M40x0.5
- **Dimensions:** Ø40 x 50 x 58.4
- **Weight (g):** 100

---

**NOTE:**

- All dimensions are unit:mm
- Dimensions are approximations and may vary slightly.
- *: Special 4-pin connector for P-iris
- **: Please note that this product is a pre-production version.
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Dimensions unit:mm

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<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Effective Aperture Front (mm)</td>
<td>21.9</td>
<td>23.4</td>
<td>23.4</td>
<td>23.4</td>
</tr>
<tr>
<td>Focal Length (mm)</td>
<td>46.5 x 0.5</td>
<td>46.5 x 0.5</td>
<td>46.5 x 0.5</td>
<td>46.5 x 0.5</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>149</td>
<td>149</td>
<td>149</td>
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</tr>
</tbody>
</table>

Dimensions unit:mm

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>M1816FC-MP</th>
<th>MG0918FC-MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format (f)</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Mount</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Focal Length (mm)</td>
<td>1.8-16C</td>
<td>1.6-16C</td>
</tr>
<tr>
<td>Aperture (f)</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Angle of View (HOR)</td>
<td>30.1</td>
<td>30.8</td>
</tr>
<tr>
<td>M.O.D. (m)</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Effective Aperture Front (mm)</td>
<td>21.9</td>
<td>23.4</td>
</tr>
<tr>
<td>Focal Length (mm)</td>
<td>46.5 x 0.5</td>
<td>46.5 x 0.5</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>149</td>
<td>149</td>
</tr>
</tbody>
</table>

Dimensions unit:mm
P-iris lenses can only be controlled by specifically designed cameras with P-iris software.

**MODEL NO.** MG1616KC-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 35
- **Aperture (f):** 1.8-16C
- **Angle of View (HOR):** 13.9
- **M.O.D. (m):** 1
- **Effective Aperture Front (mm):** 19.8
- **F.E.A. (mm):** 12.1
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 56.8 × 53.2
- **Weight (g):** 125.8

**MODEL NO.** MG520FC-MPIR

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 20
- **Aperture (f):** 1.8-300C
- **Angle of View (HOR):** 9.8
- **M.O.D. (m):** 2
- **Effective Aperture Front (mm):** 25.2
- **F.E.A. (mm):** 11.0
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 56.8 × 53.9
- **Weight (g):** 131.8

**MODEL NO.** MG911K-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 8
- **Aperture (f):** 1.8-16C
- **Angle of View (HOR):** 52.1
- **M.O.D. (m):** 1
- **Effective Aperture Front (mm):** 20.1
- **F.E.A. (mm):** 12.4
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 57.8 × 45
- **Weight (g):** 105

**MODEL NO.** MG1218K-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 12
- **Aperture (f):** 1.8-16C
- **Angle of View (HOR):** 39.3
- **M.O.D. (m):** 1
- **Effective Aperture Front (mm):** 20.0
- **F.E.A. (mm):** 19.2
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 57.8 × 45
- **Weight (g):** 103

**MODEL NO.** MG161K-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 16
- **Aperture (f):** 1.8-16C
- **Angle of View (HOR):** 30.8
- **M.O.D. (m):** 1
- **Effective Aperture Front (mm):** 21.9
- **F.E.A. (mm):** 11.0
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 57.8 × 45
- **Weight (g):** 110

**MODEL NO.** MG3518KC-MPIR

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 25
- **Aperture (f):** 1.8-16C
- **Angle of View (HOR):** 20.0
- **M.O.D. (m):** 1
- **Effective Aperture Front (mm):** 23.4
- **F.E.A. (mm):** 14.6
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø41.7 × 57.8 × 37.4
- **Weight (g):** 159

**MODEL NO.** MG2514KC-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 50
- **Aperture (f):** 2-16C
- **Angle of View (HOR):** 7.9
- **M.O.D. (m):** 2
- **Effective Aperture Front (mm):** 25.2
- **F.E.A. (mm):** 11.0
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 56.8 × 53.9
- **Weight (g):** 129

**MODEL NO.** MG902K-MP

- **Format (T):** 2/3
- **Mount:** C
- **Focal Length (mm):** 70
- **Aperture (f):** 2-16C
- **Angle of View (HOR):** 10.8
- **M.O.D. (m):** 2
- **Effective Aperture Front (mm):** 25.2
- **F.E.A. (mm):** 11.0
- **Front Filter Thread (g/m):** 40.5 × 0.5
- **Dimensions:** ø42 × 56.8 × 53.9
- **Weight (g):** 129
## ACCESSORIES

### MODEL NO. EX2CS
- **Description**: 2X Extender for CS-mount
- **Application**: Attached between lens and camera - Makes focal length 2X

### MODEL NO. EX1.5CS
- **Description**: 1.5X Extender for CS-mount
- **Application**: Attached between lens and camera - Makes focal length 1.5X

### MODEL NO. VM100
- **Description**: Extension Tube 46, 44, 32, 20, 12
- **Application**: Attached between lens and camera - Reduces minimum focusing distance

### MODEL NO. VM400
- **Description**: Vmrs Adapter Ring
- **Application**: Attached between lens and camera - Adapts C-mount lens to CS-mount camera

---

## THERMAL

### MODEL NO. TH7V1311-34
- **Focal Length (mm)**: 18
- **Aperture (F)**: 1.4
- **Image Circle (mm)**: 13.6
- **Mount (mm)**: M34 x 0.5 (Pitch)
- **Wave Band (µm)**: 8-12
- **Angle of View (HOR)**: 50.3
- **Back Focal Length (mm)**: 50.3
- **Material/Use**: Zinc Sulfide
- **Dimensions**: φ30 × 20.3
- **Weight (g)**: 19

### MODEL NO. TH7V1810-34
- **Focal Length (mm)**: 18.6
- **Aperture (F)**: 1.2
- **Image Circle (mm)**: 13.8
- **Mount (mm)**: M34 x 0.5 (Pitch)
- **Wave Band (µm)**: 8-12
- **Angle of View (HOR)**: 32.9
- **Back Focal Length (mm)**: 11.3
- **Material/Use**: Zinc Sulfide
- **Dimensions**: φ40 × 20.74
- **Weight (g)**: 20

---

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Unit:mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

### Details

- **Model NO. TH7V1311-34**
- **Model NO. TH7V1810-34**
- **Material Used**: Zinc Sulfide
- **Weight**: 19g (TH7V1311-34), 20g (TH7V1810-34)

---

### Technical Information

- **Model NO.**: TH7V1311-34, TH7V1810-34
- **Mount**: M34 x 0.5 (Pitch)
- **Wave Band**: 8-12 µm
- **Angle of View (HOR)**: 50.3° (TH7V1311-34), 32.9° (TH7V1810-34)
- **Back Focal Length**: 50.3 mm (TH7V1311-34), 11.3 mm (TH7V1810-34)
- **Material**: Zinc Sulfide
- **Dimensions**: φ30 × 20.3 mm (TH7V1311-34), φ40 × 20.74 mm (TH7V1810-34)
TECHNICAL INFORMATION

CABLE DIAGRAMS OF AUTO IRIS LENSES

FCS series (DC DRIVE)
FCS series Auto Iris Lens, equipped with auto iris mechanism by galvanometer and with ND filter, can be used with only cameras containing amplifier. Connector plug is applied to the end of the cable.

<table>
<thead>
<tr>
<th>FCS (Auto Amplifier)</th>
<th>AFCS (Same Amplifier)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iris Accuracy</td>
<td>±15% (Video level)</td>
</tr>
<tr>
<td>Sensitivity Adjustment</td>
<td>0.5V (p-p)</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>High Impedance</td>
</tr>
<tr>
<td>Transit Time</td>
<td>Approx. 2sec</td>
</tr>
<tr>
<td>Light Weighting Method</td>
<td>Adjustable between Average-Peak (to be set at average at factory)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10℃ to 50℃</td>
</tr>
</tbody>
</table>

REMOTE FUNCTIONS

1) LEVEL & ALC remotes have been functioned on the following models:
- T21Z5816AMS-CS2/AMSP-CS2
- H10Z0812AMS-2/AMSP-2
- H10Z1218AMS-2/AMSP-2

2) LEVEL remote (AS OPTION)
- T6Z5710AMS-CS/AMSP-CS
- T10Z5712AMS-CS/AMSP-CS
- T34Z5518AMS-CS/AMSP-CS
- T34Z5518AMSR-CS/AMSPR-CS
- H6Z0812AMS/AMSP
- H16Z7516AMS/AMSP (-IR)
- H16Z7516AMSR/AMSPR (-IR)

3) Override manual
- T34Z5518AMSR-CS/AMSPR-CS
- H16Z7516AMSR/AMSPR (-IR)
- H30Z1015AMSR/AMSPR

VCC represents input voltage.
- The remote voltage should be set between 1.5 ~ 5.5V, and level remote should be OFF.

WIRING DIAGRAMS FOR MOTORIZED ZOOM LENSES

Motorized zoom / 3 motor type
Iris, focus & zoom can be adjusted by controller.

<table>
<thead>
<tr>
<th>DC Drive</th>
<th>VIDEO Drive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Connect together with iris, focus and zoom for common system where necessary.
The size of camera’s imaging device also affects the angle of view, with the smaller devices creating narrower angles of view when used on the same lens. The format of the lens, however, is irrelevant to the angle of view, it merely needs to project an image which will cover the device, i.e., the same format of the camera or larger. This also means that 1/3” cameras can utilize the entire range of lenses from 1/3” to 2/3”, with a 1/3” 8mm lens giving the same angle as a 2/3” 8mm lens. The latter combination also provides increased resolution and picture quality as only the center of the lens is being utilized, where the optics can be ground more accurately.

The focal length of the lens is measured in mm and directly relates to the angle of view that will be achieved. Short focal length provides wide angle of view and long focal length becomes telephoto, with narrow angle of view. A normal angle of view is similar to what we see with our own eye and has a relative focal length equal to the pick up device. The “computar” range calculator is simple device to use for estimating focal length, object dimension and angle of view, alternatively the VM300 view finder gives an optical way of finding focal length.

Note: Regarding the wiring diagram of x60 and x20 Zoom lens, please refer to the instruction manual.
ANGLE OF VIEW

It is important to know the angle of view of the lens to take in the object. Angle of view changes with focal length of lens and image size of camera. The focal length to cover the object can be calculated from the next formula.

\[ f = \frac{V \times D}{H} \quad (1) \]
\[ f = \frac{h \times D}{V} \quad (2) \]

- \( f \): focal length of lens
- \( V \): Vertical size of object
- \( H \): Horizontal size of object
- \( D \): Distance from lens to object
- \( v \): vertical size of image (see the following table)
- \( h \): horizontal size of image (see the following table)

**Comparision of Monitoring Images**

<table>
<thead>
<tr>
<th>Focal Length</th>
<th>2m</th>
<th>5m</th>
<th>10m</th>
<th>20m</th>
</tr>
</thead>
<tbody>
<tr>
<td>f=2.8mm</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>f=3.5mm</td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>f=8mm</td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td>f=30mm</td>
<td><img src="image13.png" alt="Image" /></td>
<td><img src="image14.png" alt="Image" /></td>
<td><img src="image15.png" alt="Image" /></td>
<td><img src="image16.png" alt="Image" /></td>
</tr>
<tr>
<td>f=50mm</td>
<td><img src="image17.png" alt="Image" /></td>
<td><img src="image18.png" alt="Image" /></td>
<td><img src="image19.png" alt="Image" /></td>
<td><img src="image20.png" alt="Image" /></td>
</tr>
</tbody>
</table>

**For example**

1. In case of vertical size
   - 1/2 inch camera
   - Vertical size of object: V = 4.8mm
   - Distance from lens to object: D = 2500mm(250cm)
   - Substitute these data to formula (1)
   \[ f = \frac{4.8 \times 2500}{330} \approx 366mm \]

2. In case of horizontal size
   - 1/2 inch camera
   - Horizontal size of object: H = 6.4mm
   - Substitute these data to formula (2)
   \[ f = \frac{6.4 \times 2500}{440} \approx 366mm \]

DEPTH OF FIELD

The depth of field refers to the area within the field of view which is in focus. A large depth of field means that a large percentage of the field of view is in focus. A small depth of field has only a small section of the field of view in focus. The depth of field is influenced by several factors: a wide angle lens generally has a larger depth of field than a telephoto lens, a higher F stop setting also has a larger depth of field, and high resolution cameras have a larger depth of field.

AUTO OR MANUAL IRIS

Generally we tend to use auto iris lenses externally where there are variations in the lighting levels, manual iris lenses are normally for internal applications where the light level remains constant. With the introduction of electronic iris cameras it is now possible to use manual iris lenses in varying light conditions and the camera will electronically compensate, however there are several considerations to this option;

- The setting of the F stop becomes critical, if the iris is opened fully to allow the camera to work at night, the depth of field will be very small and it may be more difficult to achieve sharp focus even during the day, the camera can maintain normal video levels but it cannot affect the depth of field. If the iris is closed to increase the dept of field the low light performance of the camera will now be reduced.

VIDEO DRIVE OR DC DRIVE

With auto iris lenses it is necessary to control the operation of the iris to maintain perfect picture levels. Video drive lenses contain amplifier circuit to convert the video signal from the camera into iris motor control. With DC drive lenses the camera must contain amplifier circuitry, the lens now only contains the galvanometric iris motor making it less expensive. The deciding factor depends on the auto iris output of the camera, most now have both types.

F STOP

The lens usually has two measurements of F stop or aperture, the maximum aperture (minimum F stop) when the lens is fully open and minimum aperture (maximum F stop) just before the lens completely closes. The F stop has a number of effects upon the final image; a low F stop may be necessary where there is a very high level of light or reflection, this will prevent the camera "whiting out" and maintain constant video level. All auto iris lenses are supplied with Neutral Density filters to increase the maximum F stop. The F stop also directly affects the depth of field.
**Technical Information**

**C or CS Mount**

Modern cameras and lenses are generally CS mount, with CS mount cameras both types of lenses can be used but the C mount lens requires a 5mm ring (VM400) to be fitted between the camera and lens to achieve a focused image. With C mount cameras it is not possible to use CS mount lenses as it not physically possible to get the lens close enough to the sensor to achieve a focused image.

**Flange Back, Back Focal Length, and Mechanical Back Focal Length**

- **(A) Flange Back**
  Distance between the lens flange and CCD focal plane

- **(B) Back Focal Length**
  Distance between the surface of the rear lens element and the CCD focal plane

- **(C) Mechanical Back Focal Length**
  Distance between the surface of the lens frame and the CCD focal plane

**Aspherical Lenses**

Spherical lenses have constant refractive indices and are commonly used in almost all CCTV lenses. They are designed in such a way so that light passing through the glass and center of a spherical element should fall on a single point on the image plane, but causing some spherical aberration. This problem is resolved by the aspherical lens technology, enabling more light to pass through the element and to focus right on the same point as on the image plane. Supported by more advanced molding technologies, aspherical lenses eliminate the size constraints and improve the overall optical performance compared with more conventional CCTV lenses.

**Mechanism and Advantageous Effect of IR Lens**

- **Non IR Lens**
  - IR light
  - Visible light

- **IR Lens**
  - IR light
  - Visible light

Day & Night cameras normally operate in the near-infrared / infrared zones at night, making the image “out of focus” and unsuitable if used with a conventional lens. Computar has developed IR Lenses that utilize a special optical glass material which minimizes light dispersion. As a result, refocusing is not required when used with infrared lighting. The lens is manufactured with a special ED glass (extra dispersion) which does not widely disperse light of different wavelengths and with “special coating”. This combination allows the lens to deliver perfect focus under normal lighting and also under IR illumination by transmitting more light to the infrared region.

※ Monitoring images with Day & Night cameras
MEGAPIXEL

CCD and CMOS image sensors use a series of pixels arranged on a 2-dimensional grid. These pixels convert an optical image to an electronic signal. The number of pixels in an image usually defines the resolution, with more pixels meaning higher resolution. A megapixel is defined as one million pixels and a camera with a megapixel sensor is called a megapixel camera.

MEGAPIXEL LENS FOR MEGAPIXEL CAMERA

To capture the full resolution of a megapixel camera, it is essential to use a high quality megapixel lens. Overall image quality is heavily influenced by the quality of the optical image directed onto the image sensor. Megapixel lenses provide high contrast, brightness and sharpness across the entire image plane. Non-megapixel lenses will not fully display the resolution of megapixel sensors, especially in the corners of the image.

Megapixel lens with a megapixel camera
Non-megapixel lens with a megapixel camera

Megapixel lens for megapixel camera

FEATURE

- Sharp high resolution images
- High contrast and brightness
- Full megapixel sensor resolution

ENHANCING PICTURE QUALITY

Megapixel cameras with the P-iris system minimize the difference in resolution between the center and corners of the image, enhancing overall picture quality and sharpness by enabling the optimal iris position to be set. Also, P-iris limits the iris position to prevent diffraction when the iris becomes too small in extremely bright situations.

MAXIMIZE DEPTH OF FIELD

Having good depth of field throughout the scene is essential to achieve optimized image quality. Unfortunately, megapixel sensors often have small pixels which can cause a narrow depth of field. P-iris technology will optimize the available depth of field, providing overall sharper images and enhancing foreground and background resolution. This technology is particularly useful in scenes where foreground and background resolution is critical, such as in long corridors.

WIDE RANGE OF BOARD AND CS MOUNT OPTIONS

Various varifocal board lenses using P-iris technology are available to fit a variety of mini dome and bullet camera housings. Computar also offers a wide range of P-iris CS mount lenses. Each P-iris CS mount lens has a special 4-pin connector on its cable. To protect the cameras from damage, P-iris connector plugs are designed to not fit regular cameras.

※ Above pictures and chart are image of lens performance.
### Angle of View

#### Mono Focal Manual Iris

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Format</th>
<th>Focal Length (mm)</th>
<th>Aperture</th>
<th>Angle of View (HORIZONTAL)</th>
<th>UNIT: (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3Z214FCS-3</td>
<td>1/3 CS</td>
<td>2.8-14.6</td>
<td>1.4-16C</td>
<td>113.3-74.9</td>
<td>86.3</td>
</tr>
<tr>
<td>H3Z234FCS-3</td>
<td>1/3 CS</td>
<td>2.6-16.1</td>
<td>1.2-16C</td>
<td>63.9-49.1</td>
<td>29.5</td>
</tr>
<tr>
<td>H3Z345FCS-3</td>
<td>1/3 CS</td>
<td>8-22.2</td>
<td>1.2-16C</td>
<td>34.7</td>
<td>25.9</td>
</tr>
<tr>
<td>H3Z345FCS-3</td>
<td>1/3 CS</td>
<td>12</td>
<td>1.4-16C</td>
<td>22.8</td>
<td>17.0</td>
</tr>
<tr>
<td>H3Z3514FCS-3</td>
<td>1/2 CS</td>
<td>1.3-16C</td>
<td>57.4</td>
<td>42.6</td>
<td>32.2</td>
</tr>
</tbody>
</table>

#### Mono Focal Auto Iris

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Format</th>
<th>Focal Length (mm)</th>
<th>Aperture</th>
<th>Angle of View (HORIZONTAL)</th>
<th>UNIT: (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3Z214FCS-3</td>
<td>1/3 CS</td>
<td>2.8-14.6</td>
<td>1.4-16C</td>
<td>113.3-74.9</td>
<td>86.3</td>
</tr>
<tr>
<td>H3Z234FCS-3</td>
<td>1/3 CS</td>
<td>2.6-16.1</td>
<td>1.2-16C</td>
<td>63.9-49.1</td>
<td>29.5</td>
</tr>
<tr>
<td>H3Z345FCS-3</td>
<td>1/3 CS</td>
<td>8-22.2</td>
<td>1.2-16C</td>
<td>34.7</td>
<td>25.9</td>
</tr>
<tr>
<td>H3Z345FCS-3</td>
<td>1/3 CS</td>
<td>12</td>
<td>1.4-16C</td>
<td>22.8</td>
<td>17.0</td>
</tr>
<tr>
<td>H3Z3514FCS-3</td>
<td>1/2 CS</td>
<td>1.3-16C</td>
<td>57.4</td>
<td>42.6</td>
<td>32.2</td>
</tr>
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</table>

#### Vario-Focal Manual Iris

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Format</th>
<th>Focal Length (mm)</th>
<th>Aperture</th>
<th>Angle of View (HORIZONTAL)</th>
<th>UNIT: (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3Z214FCS-3</td>
<td>1/3 CS</td>
<td>2.8-14.6</td>
<td>1.4-16C</td>
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#### Video Drive

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#### Manual Zoom

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#### Manual Zoom with Auto Iris

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### Picture 1: ANGLE OF VIEW

#### MOTORIZED ZOOM

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#### MEGAPIXEL VARI-FOCAL

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#### SECURITY / ITS / FA - IMAGE PROCESSING

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### Picture 2: ANGLE OF VIEW

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#### THERMAL

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### Picture 3: ANGLE OF VIEW

#### PINHOLE

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#### MEGAPIXEL VARI-FOCAL

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### Picture 4: ANGLE OF VIEW

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